Part 1:

Matplotlib uses PSF license and by accepting the terms, users agree to use matplotlib in "source or binary form and its associated documentation." (Matplotlib) Matplotlib offers a series of plotting functions and allows users to customize the graphs. In addition, users can get access to matplotlib's mathematics extension NumPy and show the result accordingly. Matplotlib supports interactivity and pyplot, an interface comes with matplotlib package, helps to display interactive plots. Functions like ion() and ioff() to switch interactive mode and other controlling functions to monitor the activity. Set_camp() helps to update the maps and show results before and after the updates for better comparisons. Moreover, FuncAnimation() enables individuals to customize animated functions and recursively call the function to enforce the animation. Some of the advantages of Matplotlib include its flexibility in numbers of platforms and operating systems. Various plot types are provided in the Matplotlib package for multiple plotting purposes and large datasets can be manipulated, displayed and visualized on pyplot interface. However, a more interactive and complicated API is needed for complex graphs because Matplotlib package can be outdated to support newest graph types in order to fulfill user needs.

Unlike Matplotlib, bqplot adopts Apache Software License and offers interactive plotting functions for Jupyter notebook. Bqplot does an outstanding job when it comes to interactive graphs since most of its attributes can be customized and made personal. More functions like pan/zoom, selector and BrushInterval have added additional ways for users to explore and play around data visualizations. Developers can adjust the marks, axes, labels and scales for ideal outcomes. In addition, a default toolbar comes with the

interface so that users have more control over the graph to reach the goal of interactivity. Bqplot can be one of the easiest packages to use for interactive graphing because all these embedded functions save developers much time from coding and provide promising outcome using simple command lines. One drawback for bqplot is that the outcomes will not stay in notebook unless running the code again. Bqplot graphs are missing when downloading notebook file. Screenshots can always do but interactions cannot be recorded indeed.

The third visualization tool is Plotly. Plotly also uses MIT license and aims to offer graphing functions based on browser utilities. It allows online collaboration and users to accomplish technical graphing in high-level complexity. The toolkit includes Dash framework that enables the graphing functions, and all attributes can also be changed according to difference usage and purposes. Using FigureWidget function in plotly.graph_objects, additional functions are required if users want to add their own interactions to the graph. Developers can customize effects on hovering, selectors and layout options to set ideal settings for professional and technical graphs. Categories including Artificial Intelligence, statistics and finance are provided. Custom control tools, 3d plots and animation functions can also be added according to user needs. Plotly supports a number of platforms and allows interactive html webpage export. In this way, professionals will find it easy to implement different graph to their fields and html export makes sure users can also interact with graphs. Since Plotly offers advanced graph types, it can lack of graph variety for fundamental graph types. In addition, developers currently do not have access to change style of interactive graphs yet.

R has GNU General Public License which guarantees individuals has freedom to share and change the software. One of the main goals of R is to provide a platform that

offers graphing functions to perform data analyzations. A significant number of plot types are covered in R library to guarantee users with their usage needs. Some rare yet useful graph types include circlepacker, chorddiag and collapsibletree give users more options to showcase and present results using data visualization. Ggplot() comes with the R package and it generates quality graphs efficiently. Ggplotly() turns contents from ggplot() into interactive graphs and users can also alter attributes to reorder, to re-deign chart appearances, to zoom etc. Additional packages like shiny help to extend basic functions to interactive web page. Users can alter styles accordingly as well. Unlike a lot of other tools, R also support exporting interactive chart to html or png files. In addition, R offers a huge number of packages to fulfill most user needs. However, R occupies a chunk of local memory so that the speed will be reduced for larger files. By having too many packages, users can also get lost by options.

Part 2:

Github.io age: https://wheeendiii.github.io/

Work Cited

Matplotlib documentation(v3.3.3). https://matplotlib.org/3.3.3/users/license.html